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ABSTRACT

Presented is a series of activity cards developed in order to help children explore mapping ideas in a variety of ways. Children work with concrete materials such as blocks, puzzles, checkerboards, and three-dimensional graphs. Concepts covered include scale, the usefulness of symbols, and relationships. The games can be used with individuals, small and large groups, and in any sequence. Each activity card includes materials needed and student directions. (Author/DS)

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mapping games

E | elementary
S | science
S | study

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SE 033 243

1 2 3 4 5 6 7 8 9 10 ININ 80 79 78 77 76 75 74 73 72 71

mapping games

1 I SEE SOMETHING
2 FINDING SHAPES
3 ENCLOSING SHAPES ON A GEOBOARD
4 MEASURING THE "OUTSIDES" OF GEOBOARD SHAPES
5 SHADOW-SCREEN SHAPES
6 COMPARING BLOCK PATTERNS
7 MATCHING COLOR CUBES ARRANGEMENTS
8 DUPLICATING TANGRAM PATTERNS
9 DESCRIBING PLAY PLAX CONSTRUCTIONS
10 MAPPING THE ROOM
11 DRAWING DIFFERENT VIEWS OF BLOCKS
12 HOLDING AN OBJECT IN THE SAME DIRECTION AS AN OBJECT YOU CAN'T SEE
13 MATCHING ONE BLOCK WITH A DIAGRAM
14 MATCHING SEVERAL BLOCKS WITH A DIAGRAM
15 MATCHING BLOCK BUILDINGS WITH PHOTOGRAPHS
16 DRAWING DIFFERENT VIEWS OF THE SCHOOL
17 MATCHING OBJECTS WITH SYMBOLS
18 MAKING PICTURE SENTENCES AND USING CODES
19 READING SYMBOLS ON MAPS
20 TWENTY QUESTIONS ON A MAP
21 LOOKING AT DIFFERENT MAPS
22 FOLLOW-THE-LEADER ON A MAP
23 MAPPING YOUR WAY FROM SCHOOL TO HOME — TAKE AN UNUSUAL ROUTE
24 MAPPING YOUR WAY HOME — ON FOOT
25 FOLLOWING GEOBOARD PATHS
26 FINDING YOUR WAY AROUND THE ROOM
27 FINDING YOUR WAY OUTDOORS
28 PATH PUZZLES
29 HIDE AND SEEK WITH A COMPASS
30 COPYING PICTURES USING GRAPH PAPER
31 TIC-TAC-TOE
32 2-D CHECKERS
33 BATTLESHIP
34 USING GRAPH PAPER TO ENLARGE AND REDUCE PICTURES
35 MAKING BLOCKS LOOK BIGGER OR SMALLER
36 ENLARGING AND REDUCING SHADOWS
37 3-D TIC-TAC-TOE
38 FINDING AN OBJECT IN 3-D
39 MAKE YOUR OWN MAPPING GAME

mapping game 1

I see something

(2 to 4 people; could be played with whole class)

You need

measuring equipment: yardsticks, string rulers

The leader chooses an object without telling anyone what it is. He says, "I see something . . . ," then names a color. Everyone tries to guess what it is.

or

Leader says, "I see something . . . and . . . ," then names both its color and its shape.

or

Leader names color, shape, and size.

or

Leader names color, shape, size, and location (where in the room or yard it is).

This game gets harder and harder for the leader and easier for the guessers as the rules get more complicated.

An example for the last game might be — "I see a yellow and black object. The shape is a hexagon (drawing). It is about 2 inches wide, 6 inches around. It is on a table 4 feet off the ground. It is 17 paces from the teacher's desk. What is it?"

Can the guesser get it on the first try?

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mapping game 2

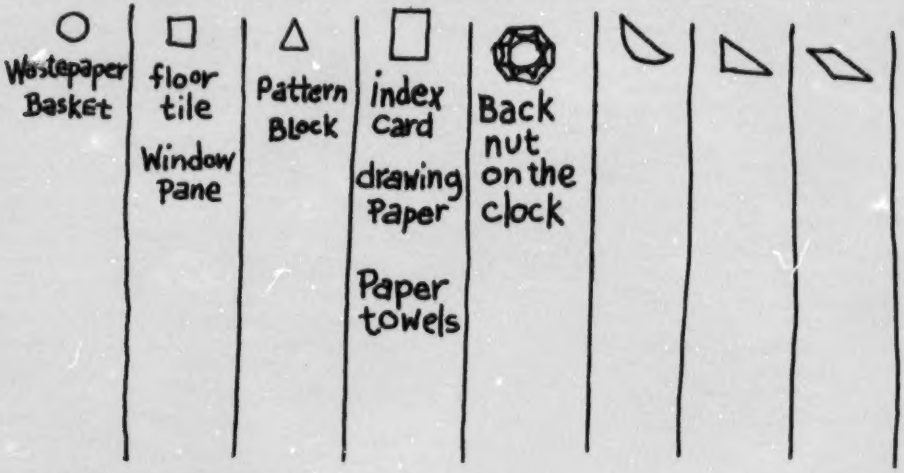
finding shapes

(2 people, up to the whole class)

You need

Paper and pencil

Draw some columns on your paper. At the top of each column, draw a different shape. For example —



List any objects you can find that have the same shape as the drawings.

Compare your list with the lists others in your group have made.

Which shapes have the longest lists under them?

Which have the shortest?

Another game —

Look at something complicated — a bicycle, a bridge, a bulletin board. How many different shapes can you find in it?

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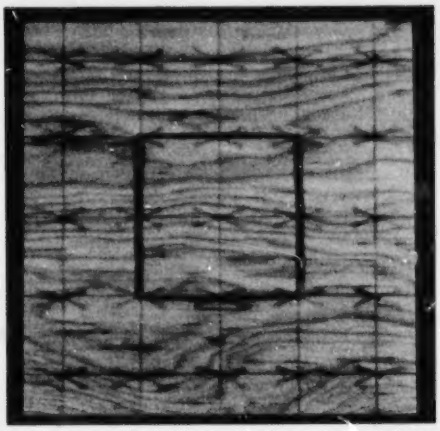
mapping game 3

enclosing shapes on a geoboard

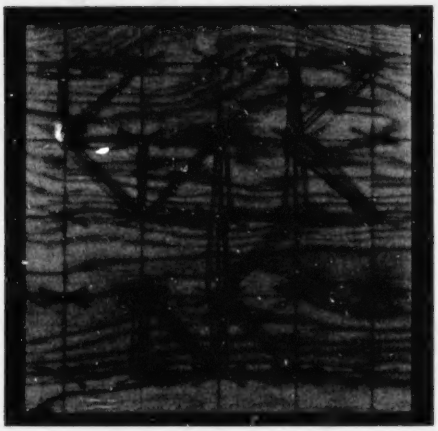
(1 person per board)

You need

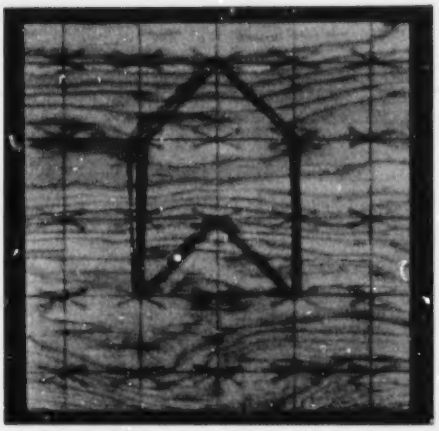
10-pin geoboard
colored rubber bands
graph paper
pencil



This picture shows a rubber band enclosing four squares on the geoboard.



Try crisscrossing the rubber band. How many ways can you enclose the four-square space?



Without crisscrossing, how many ways can you make one rubber band enclose the same amount of space as above? Here's one way:

Keep track of your figures by drawing them on graph paper. Do you get more pictures with crisscrossing or without?

Play the same game enclosing three, five, or six squares on graph paper. Keep a record of the shapes you make.

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mapping game 4

measuring the "outsides" of geoboard shapes

(1 person per board)

You need

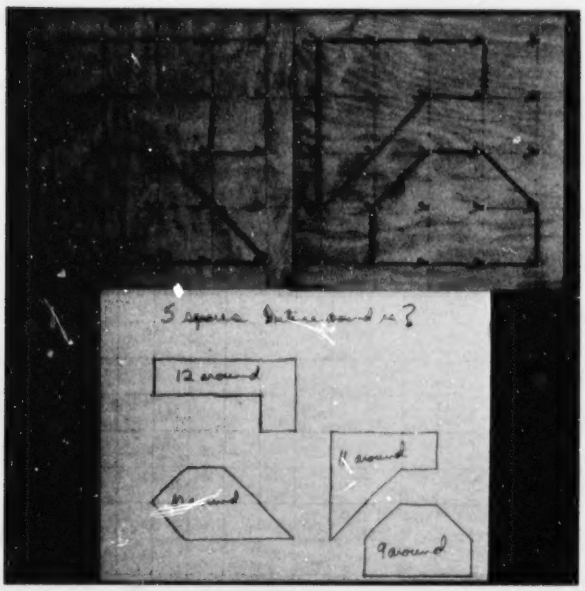
10-pin geoboard
rubber bands
graph paper and pencil
string
scissors

Enclose a figure of four squares on the geoboard with a rubber band. Count the number of spaces around the figure. Make another figure that encloses the same amount of space (adding up to 4 squares), and measure its length. String may be helpful. Make other figures, and do the same.

What does your four-square figure that has the longest line around the outside look like? Compare this with the figure with the shortest outside line.

Can you tell at a glance whether a figure has a long "outside" or a short one? What things make a difference in the length of the line?

Keep a record of your figures on graph paper.



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mapping game 5

shadow-screen shapes

(2 or 3 people)

You need

- set of Geo Blocks
- any small objects
- modeling clay
- shadow screen (made from 2 rulers or probe sticks stuck in modeling clay with paper taped between them)
- light source (or bright sunlight)

Set up the shadow screen with a light source behind it. Place a block between the light and the screen.

Just by looking at the shadow, can your partner guess what shape the block is? Does he need you to turn it around so that he can figure out what it is? What view tells the most about the block?

Collect some other objects, or make some with modeling clay. Keep them simple. Now, put one of them behind the screen and give your partner some modeling clay. Can he match your object with his modeling clay just from looking at the shadow? Maybe it's easier for him to draw the object. He may ask you to turn the object in any direction.

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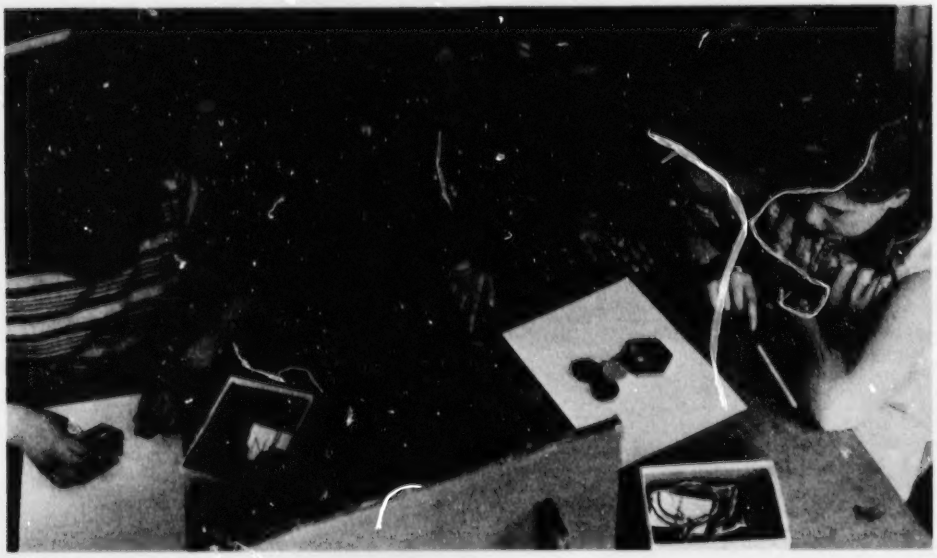
mapping game 6

comparing block patterns

(2, 3, or 4 people)

You need

set of Attribute Blocks or Pattern Blocks (or any blocks that can be divided into two similar sets)
graph paper or a checkerboard
a screen



Divide the blocks so everyone has a similar set. Take turns building a pattern without letting the others see it. Can you tell others how to make their patterns just like yours? Don't let them see your pattern. Can you tell them without pointing? Don't look at their patterns.

What mistakes did they make?

Try doing the same thing again, only this time build on graph paper or on a checkerboard. Does this make it easier to explain patterns?

After everyone has had a turn, shuffle the blocks, and divide them among the players in a different way. For example, if you started with blocks of the same color, try size or shape. Now build with your new group and describe it to the other players to match.

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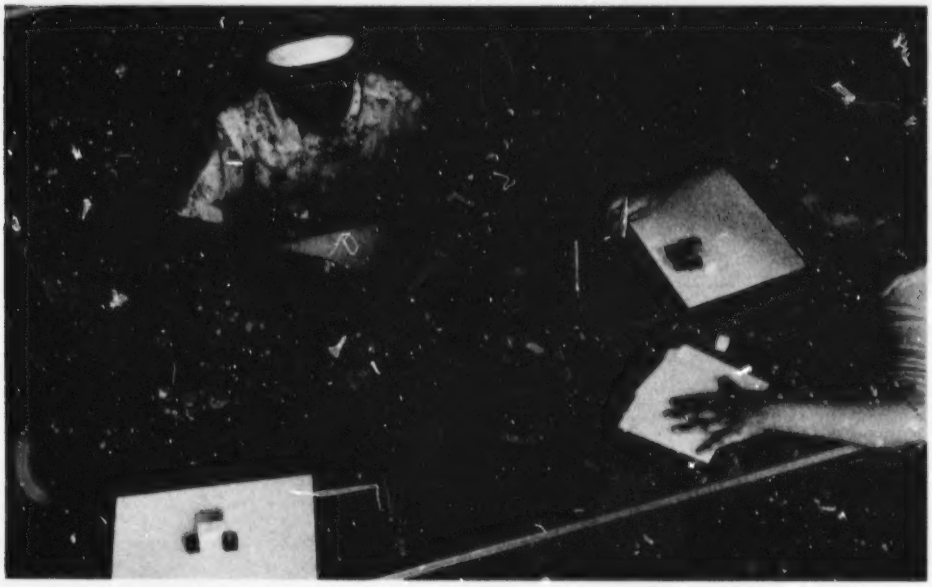
mapping game 7

matching color cubes arrangements

(2 people)

You need

set of Color Cubes
pencil and paper
graph paper
a screen



Sit so the screen is between you and your partner. Build a pattern or a building with cubes of only one color, making sure that your partner doesn't see what you have built.

Describe your construct[illegible] your partner — aloud, or by drawing it, or in a note — so that he can build one just like yours.

Now build something on a piece of graph paper. Without pointing (stay behind the screen), tell your partner where to put his blocks on the piece of graph paper so that his building will match your building.

Try making buildings that go up, as well as buildings that are flat.

Try using several colors.

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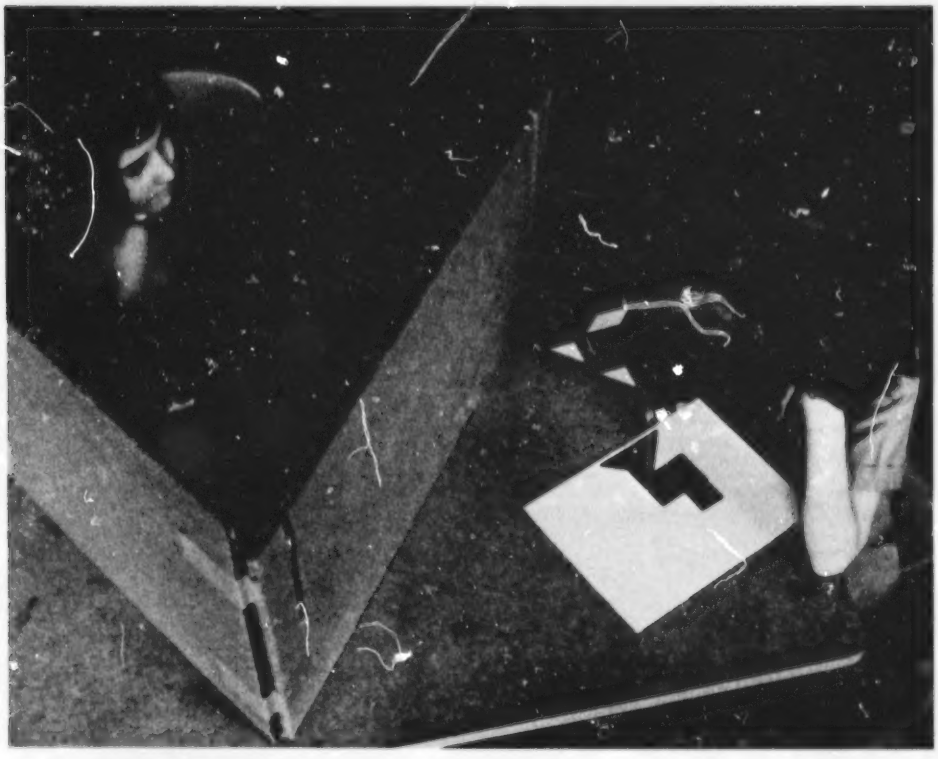
mapping game 8

duplicating tangram patterns

(2 or more people)

You need

sets of Tangram Pieces
checkerboards or graph paper
tabletop screen



Put up a screen so that you can't see what your partner is doing.

Make a design with your Tangram Pieces. Tell your partner where to place each of his Tangram Pieces so that he can create a pattern which looks exactly like yours. (You don't have to use all the pieces.)

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mapping game 9

describing play plax constructions

(2 people)

You need

1 set Play Plax squares
graph paper
tabletop screen

Place a screen between you and your partner.

Divide the Play Plax squares so that each of you has the same colors and the same number of pieces.

Build something, but don't let your partner see it. Tell him where to place his Play Plax squares, so that his building will look the same as yours.

What methods did you use to give him the right directions?

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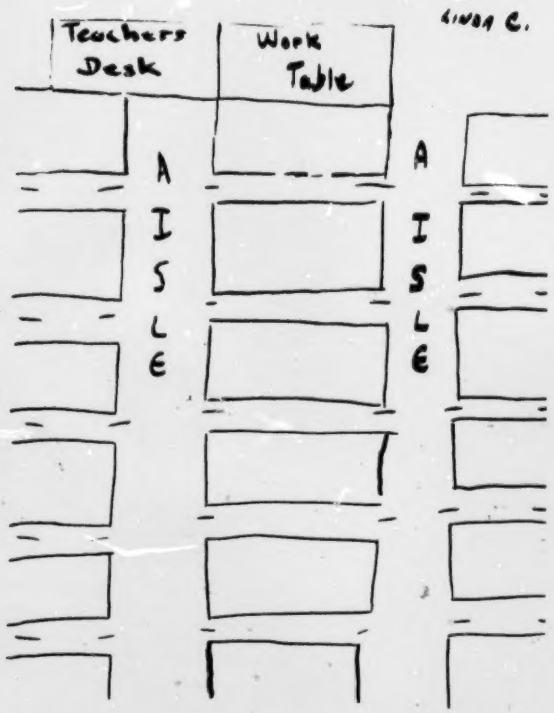
mapping game 10

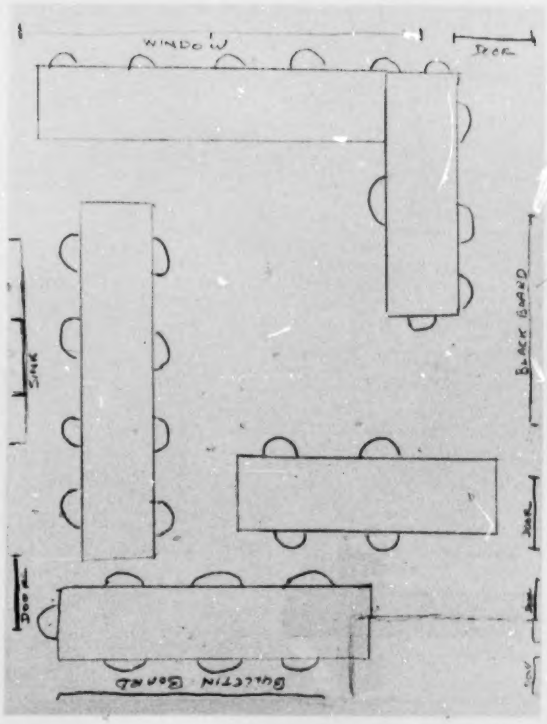
mapping the room

(1 or 2 people, up to the whole class)

You need

drawing materials





These pictures show some maps that other students have made of their classrooms.

Can you imagine what these classrooms look like? Are there things you would like to know that you can't find out from the maps?

Make a map of your classroom. You'll have to decide where things go, how big things should be, where you'll stand when you draw the map, and other things, such as whether or not to show the lights on the ceiling.

When you've finished, see if you can use your map to help someone else find an object in the room.

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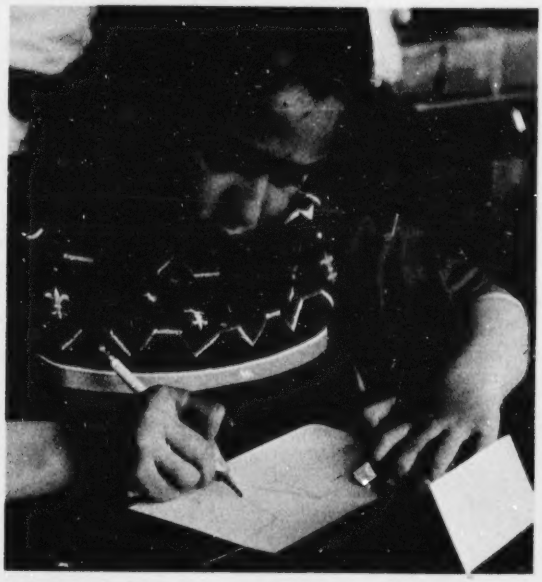
mapping game 11

drawing different views of blocks

(1 or 2 people)

You need

Geo Blocks or big kindergarten blocks in assorted shapes
drawing materials



Choose any block, and stand it in one position on your desk. Put your eye down level with the desk top and look at one side of the block. What shape is the block from where you are? Draw it on your paper.

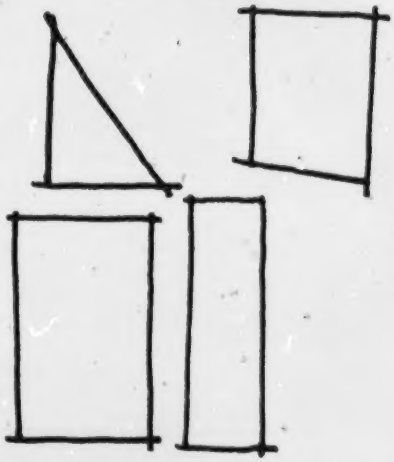
Move to another position around your desk so you can see another side of the block. Look at it and draw it. Draw all sides.

Now, stand over the block and look down on it. What is the shape of the top? Draw it.

Can you draw the shape of the bottom without looking at it?

Give your drawings to someone else, and see if he can find the block.

Someone made a drawing of this block. Can you pick out the block?



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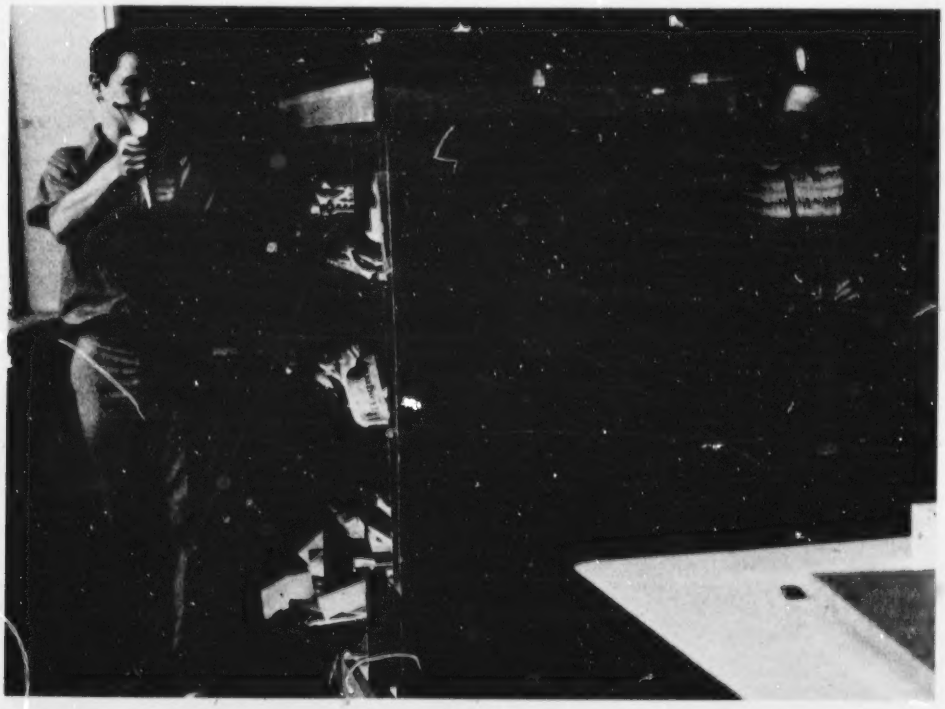
mapping game 12

holding an object in the same direction as an object you can't see

(2 people)

You need

2 objects exactly alike (2 toy animals, 2 model cars, 2 pictures)
a screen



Behind a screen, one player places his object in a certain direction. Then without pointing or using his hands, he tries to explain to the other person how the object looks, in what direction it faces, whether it is standing or lying, whether it is open or closed.

The second player tries to place his object so that it looks like his partner's object.

When the screen is taken away, are the objects facing exactly the same way?

What are the *fewest* directions you have to give to get the other player to place his object so that it looks like yours?

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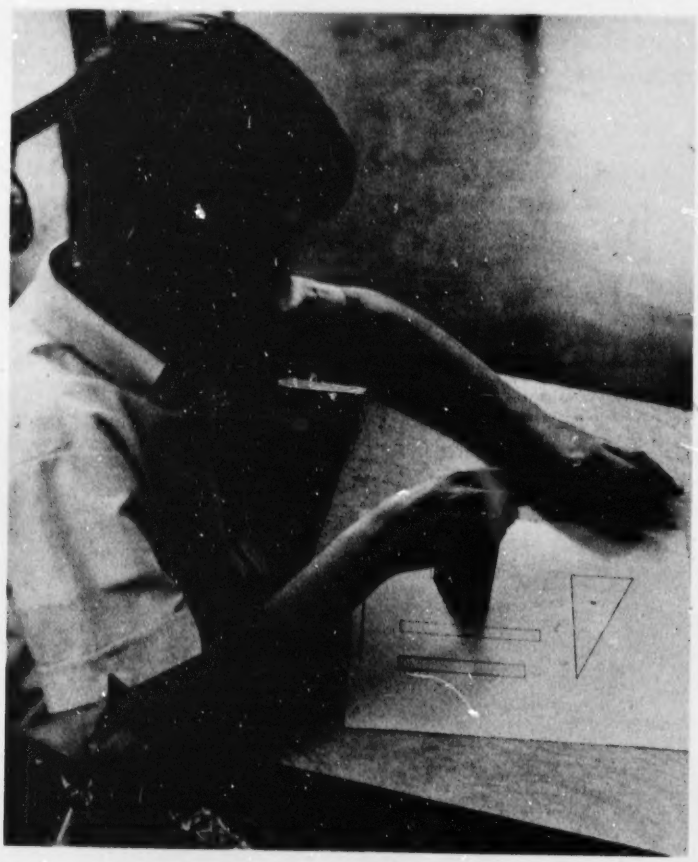
mapping game 13

matching one block with a diagram

(1 or 2 people)

You need

Yellow Card Set from the Problem Cards for Geo Blocks
set of Geo Blocks
drawing materials



Find a block to match each yellow card.

Look at the block on all sides. Each card has outline drawings showing all the sides of *one* block.

Make up some block cards of your own.

Have someone else try to figure out which block you drew.

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mapping game 14

matching several blocks with a diagram

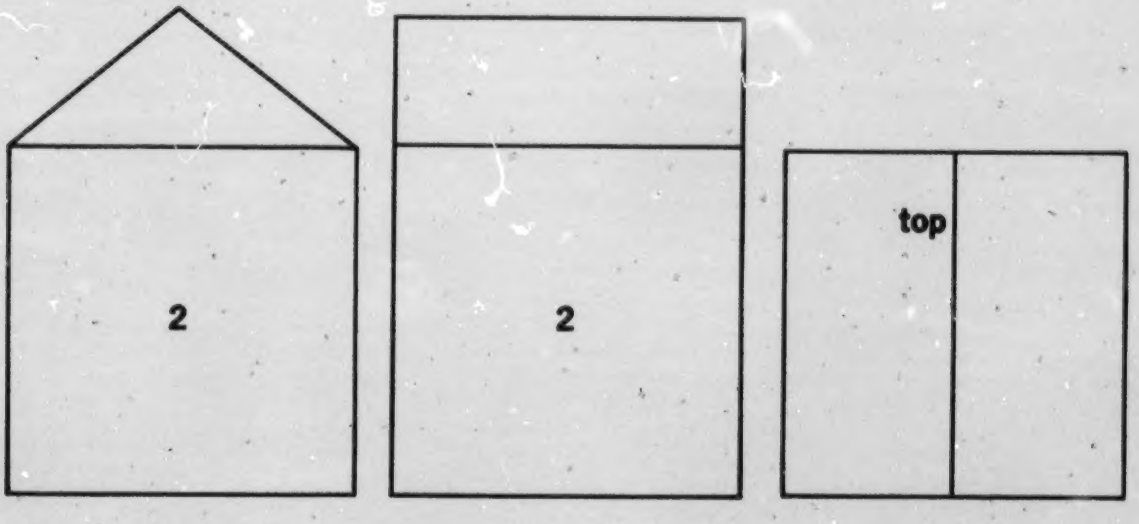
(2 people)

You need

Blue Card Set from Problem Cards for Geo Blocks
set of Geo Blocks

Each card describes a different construction made of several blocks. The number in the top righthand corner of the card tells you how many blocks are used. The card has a series of outline drawings on it, each of which shows the way the block construction looks from a different side. The outline labeled "top" shows how it looks from above. An outline with a number in it means the construction looks the same on two or more sides. (None of the drawings shows the bottom of the construction.)

Try to build each block construction, making it match all the drawings on the card. See if your partner can pick out the card that matches your construction.



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mapping game 15

matching block buildings with photographs

You need

photograph set from Problem Cards for Geo Blocks
set of Geo Blocks

There are twelve sets of photo cards. In each set, there are five photo cards which show four different side views and one top view of a block building. To play this game, you use the cards to build a block building which, when it is finished, looks like the views on the cards.

A sixth card might be called an answer card, in that it gives you a "tell all" view of the block building. Don't use the answer cards until *after* you have finished your construction.

If another person uses the same cards as you did, does his building look like yours?

Can someone else figure out which five cards match your building?

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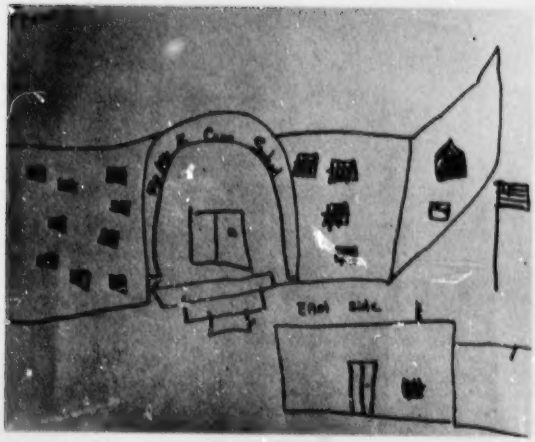
mapping game 16

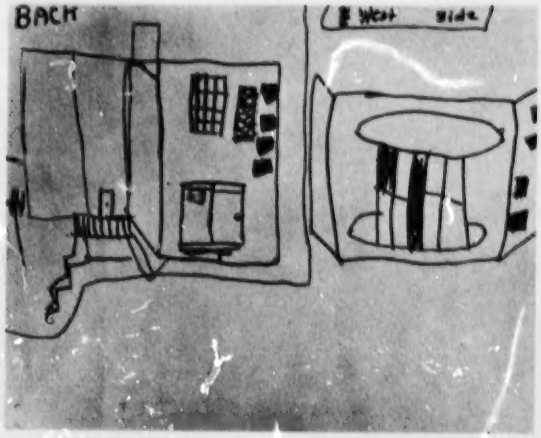
drawing different views of the school

(2 people)

You need

paper
pencil





Stand about 100 feet away from the front of your house or school building. Draw a picture of it.

Now, go around to a side or to the back and draw another picture of it.

Stand at one corner of the building. Try to make a drawing of what you see from there.

Imagine that you are in a helicopter hovering over the building. Try to draw what you would see of the building from the air.

Let someone else see your drawings. Have him try to figure where you were standing when you drew each side of the building.

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mapping game 17

matching objects with symbols

(2 or 3 people)

You need

a collection of small objects (eraser, thumbtack, nail, pin, screw, chalk, toy soldiers, miniature trains, toy cars)
drawing materials

Collect a set of objects. Place them on a desk.

Choose one, but don't let anyone know which one you picked. (Don't even touch it.)

Draw a picture of the object. Have someone else look at your drawing and tell you which object you chose.

Now draw a set of symbols (signs) that could stand for each of the remaining objects without necessarily looking exactly like them.

Have someone else match your objects with your symbols.

Match the names on list A with the symbols on list B.

A
shoe
pencil
car
tree
thumbtack

B

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mapping game 18

making picture sentences and using codes

(1 person)

KEY	
a =	1
b =	2
c =	3
d =	4
e =	5
f =	6
g =	7
h =	8
i =	9
j =	10
k =	11
l =	12
m =	13
n =	14
o =	15
p =	16
q =	17
r =	18
s =	19
t =	20
u =	21
v =	22
w =	23
x =	24
y =	25
z =	26

Using the key, decode the following:

3 1(14) (25)(15)(21) (13)1(11)5

(21)(16) (19)(15)(13)5 3(15)(18)5(19)

(15)6 (25)(15)(21)(18) (15)(23)(14)?

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mapping game 19

reading symbols on maps

(3 or 4 people)

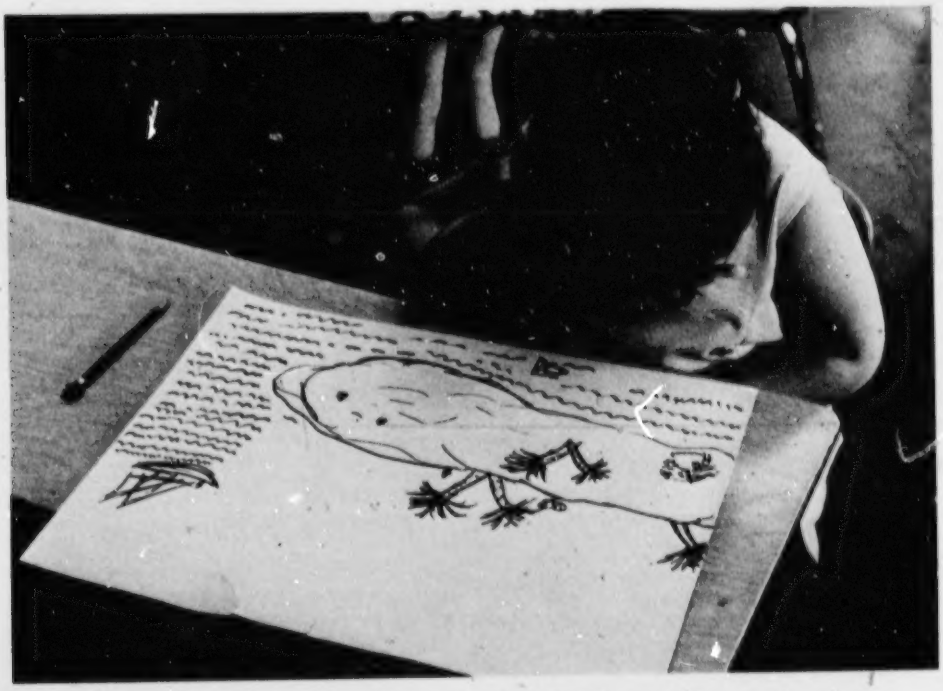
You need

large piece of paper
crayon
pencil

Can you read this map of an island? Copy this map and make your own key for it. Add things to the map so that it tells more about what kind of island this is. Have other people look at the additions and tell you what it might be like to live there.

Compare your key of the island with other people's keys. Do you agree on what the symbols mean? If you do not agree, do you think each key makes sense?

You may want to redraw this island on a large piece of paper.



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mapping game 20

twenty questions on a map

(4 or 5 people)

You need

a large enough map so that everyone who is playing can see it.

One person is the leader. The rest of the group may ask questions.

The leader thinks of a place on the map. The others ask questions, such as —

Is it west of the Mississippi?
Does it have a large river running through it?
Is it full of large cities?
Do they grow a lot of corn there?
Was Abe Lincoln born there?
Does it have the highest mountain in the United States?

Everyone who wants to should have a chance to be a leader.

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mapping game 21

looking at different maps

(Several groups of 2 or 3)

You need

collection of different kinds of maps: road maps, survey maps, local maps, state maps, world maps, weather maps, maps of the moon

pencil and paper

Each group studies a different map.

If you have a local map, find the location of your house, your school, the nearest church, the fire station, the library.

What does each color on the map mean?

What do the dots and solid lines mean?

(You may want to keep notes of what you find.)

After you have studied one map for a while, you can be considered the expert on your map.

Exchange your map with another group. Look at the second map.

Do colors, lines, and symbols have the same meaning on this map as they did on the first one?

Which things are the same and which are different on the two maps?

Check back with the original map readers. Compare your notes with theirs.

Did you discover the same things?

Compare the two maps (or more if you have more groups).

Which map gives the most information?

What would you use each map for?

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mapping game 22

follow-the-leader on a map

(2 or more people)

You need

a wall map (a familiar map, such as a map of the United States, or a topographic map of the school locale)
ruler or pointer

One person is the leader. He gives directions to the player who moves a ruler or a pointer on the map to where the leader tells him. The leader may use only words.

In one game, the player is never allowed to lift his pointer off the map.

In another game, someone thinks of a specific location on the map, writes it down, hides it from the leader and the rest of the players. The leader gives different directions to each player in turn. The player who ends up closest to the hidden location is the next leader.

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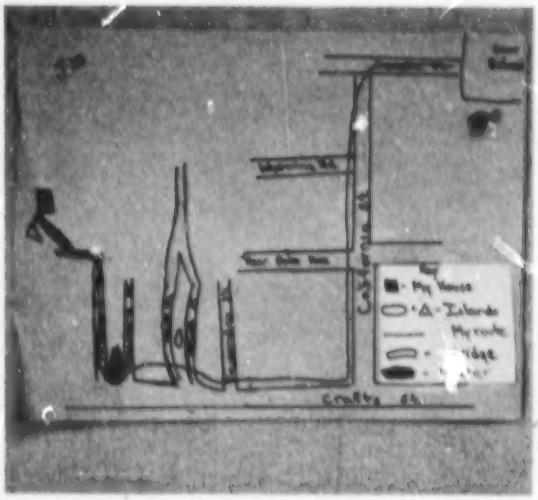
mapping game 23

mapping your way from school to home—take an unusual route

(1 person)

You need

drawing materials
commercial maps of the area (for reference)



Draw a map showing how you would go home from school if you were traveling —

a. by helicopter
b. along telephone wires
c. on a bike
d. in a car
e. by boat

Try as many of these as you like.

How do your maps differ from one another?
What landmarks are important in each case?
What would a stranger need to know to follow these routes?

Try one of your maps out on someone else. Does it work? Can he read your map — or, better yet, follow it?

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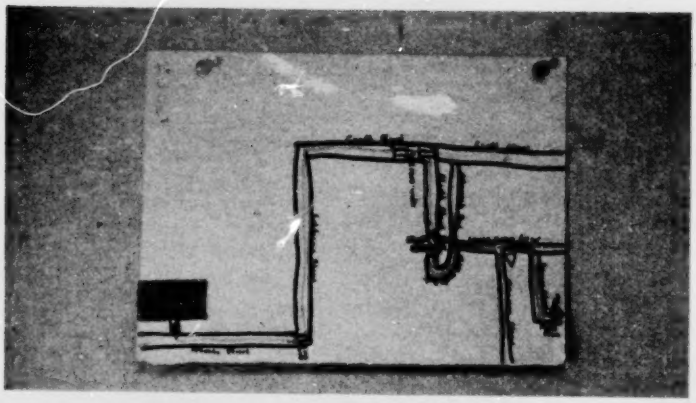
mapping game 24

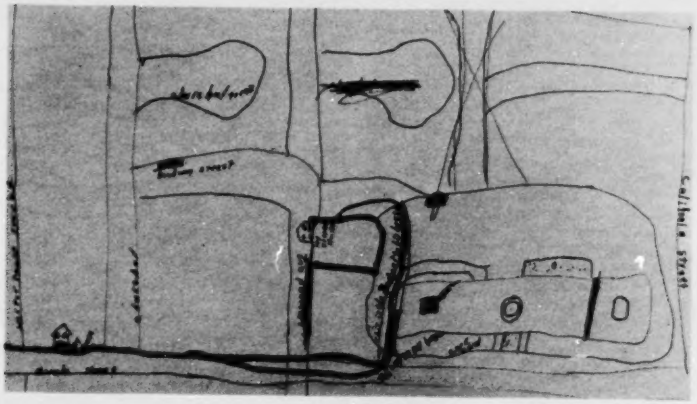
mapping your way home—on foot

(1 person)

You need

drawing materials





Draw a map showing the easiest way to go home from school on foot. Show all the shortcuts you usually take. Show all the landmarks a stranger would have to know about to get to your house in the shortest time.

Time how long it takes you, and put that on your map, too.

Give your map to someone and see if he can follow the route.

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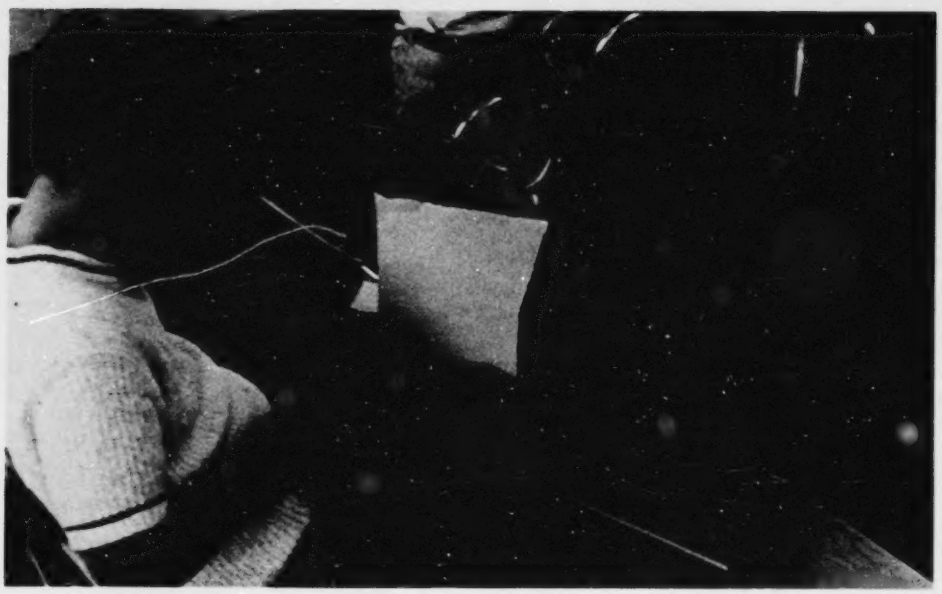
mapping game 25

following geoboard paths

(2 people)

You need

2 10-pin geoboards
colored rubber bands or yarn
watch or clock
a book or other screen



Stand an open book or a large piece of cardboard between you and your partner so you can't see each other's geoboards. Using a rubber band or yarn, make a path on your geoboard. Explain to your partner how he can make a path that looks just like yours on *his* board.

Now, let your partner make a path on his board and try to tell you how to make one that looks like it.

Make longer paths, adding rubber bands or yarn. How long does it take you to explain a path that goes between ten nails?

Describe your path to someone who doesn't have a geoboard. Ask him to draw your geoboard path on a plain piece of paper.

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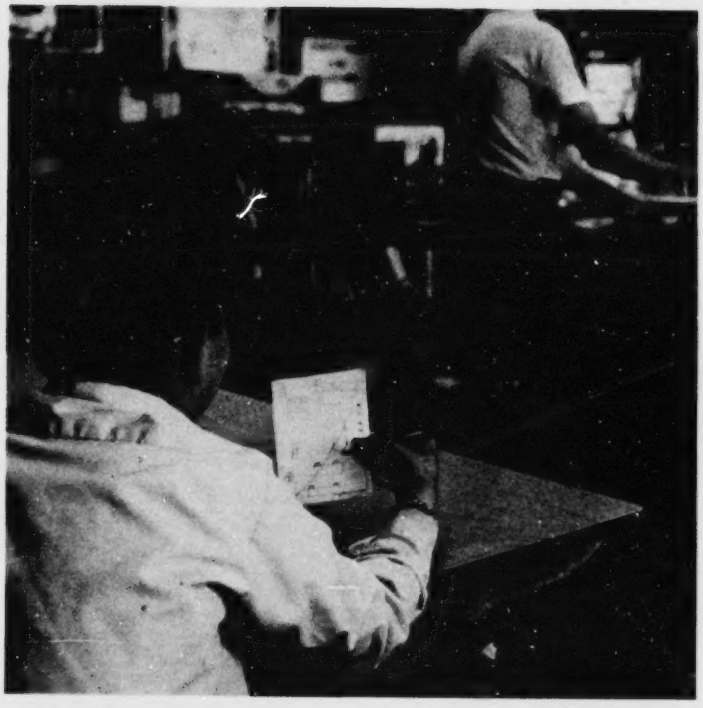
mapping game 26

following your way around the room

(2 or more people)

You need

pencils
index cards



Pick two points in the room that are at least 15 feet apart, and call them A and B. Do not tell your partner where they are. Make sure that there are things like desks and chairs between A and B.

Write directions or draw a map to guide your partner to A and from A to B without banging into any furniture. You can tell him where A is if he needs a clue. Then blindfold yourself and have your partner give you the directions out loud. Were you able to find your way from A to B?

Pick another two points. If you first used directions like left, right, straight, or back, try some new ones.

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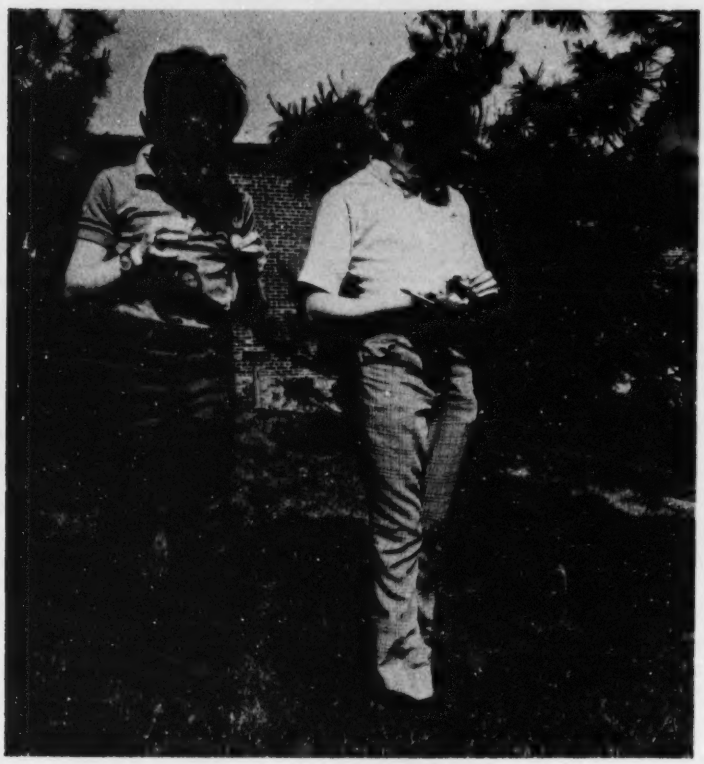
mapping game 27

finding your way around outdoors

(2 or more people)

You need

- a directional compass
- pencils
- index cards



Pick three places in the schoolyard that are far apart, and call them A, B, and C.

Write how to get from A to B to C, using distances and compass headings.

Give the same written directions to several people. Do they all end up in the same place?

Try giving directions, using only landmarks.

Try to give useful directions without giving distances.

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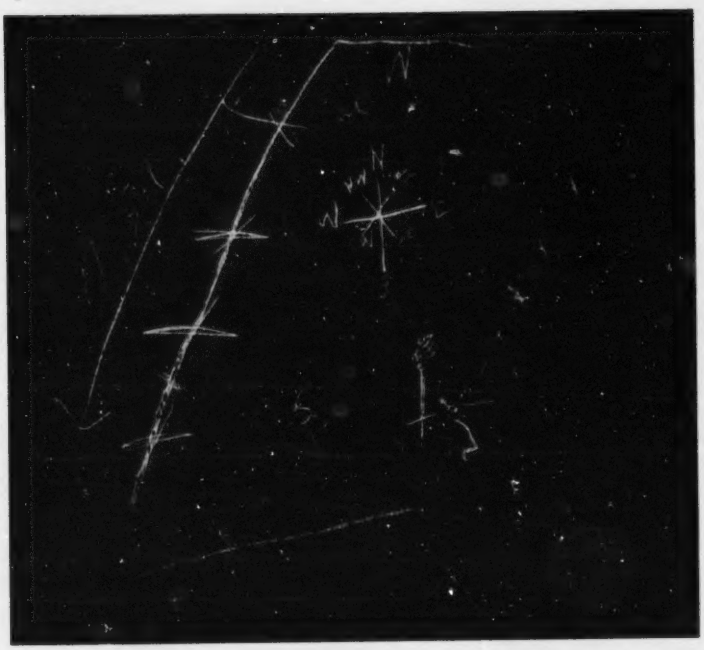
mapping game 28

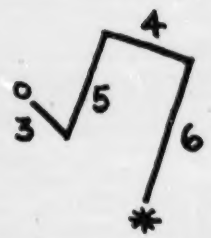
path puzzles

(2 people)

You need

index cards
paper
pencils



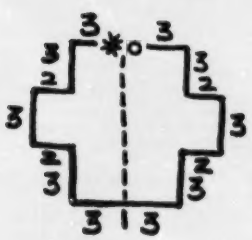


Have your partner draw a path with 4 moves, starting in a place where there is a lot of room. Can you predict, *before* you walk it out, where the path will end? Try it and see. Try one with 5 moves, 6 moves. For how long a path can you predict the end correctly?

On an index card, draw a path that, when you walk it out, gets you back to where you started in 4 moves, 5 moves.

These are pictures of "mirror paths." Put a mirror on the dotted line and look in the mirror. When you take the mirror away, your path should look the same as it did when the mirror was still there.

Try writing word directions for a mirror path.



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mapping game 29

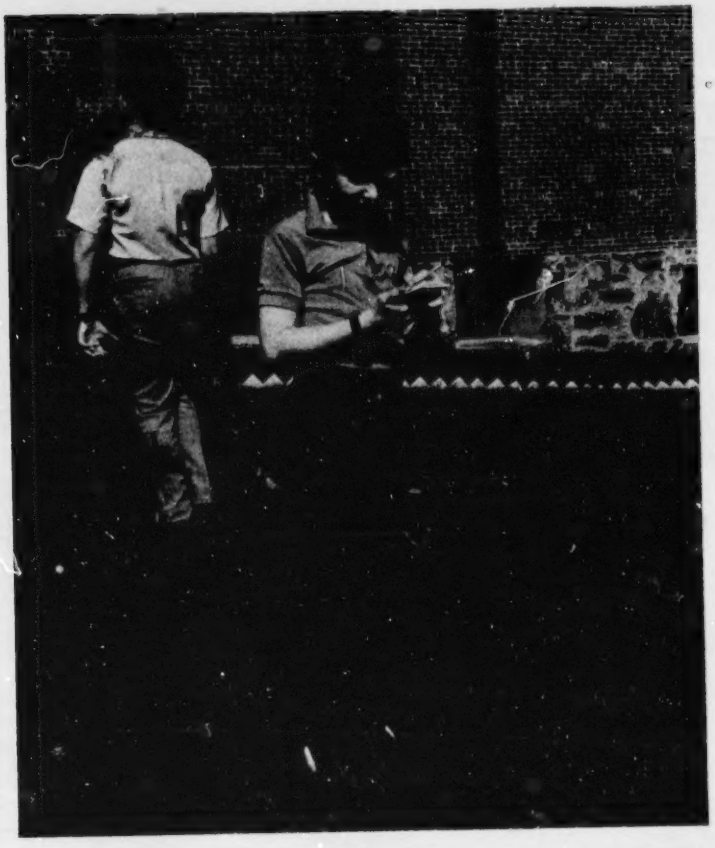
hide and seek with a compass

(2 to 4 people)

You need

an object to hide

a directional compass for each player (Often compasses don't work when they have been stored together in a box, so check them out before you use them.)



One person hides an object. He gives the *fewest* possible compass directions to the hiding place. He may not point or give landmarks as clues. Everyone should have a turn to hide the object and give directions.

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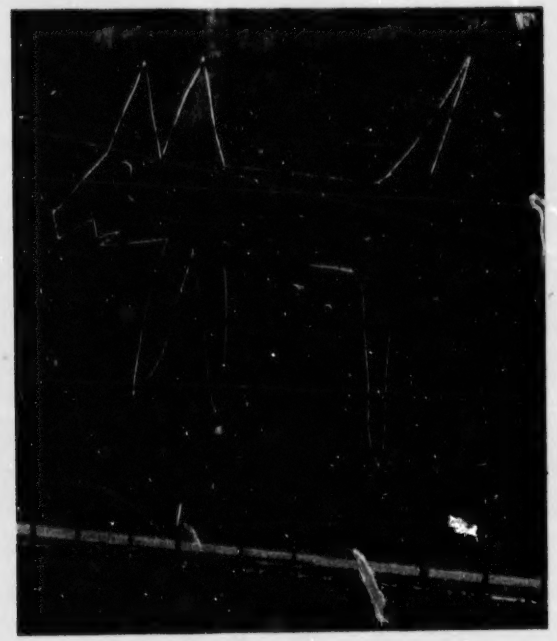
mapping game 30

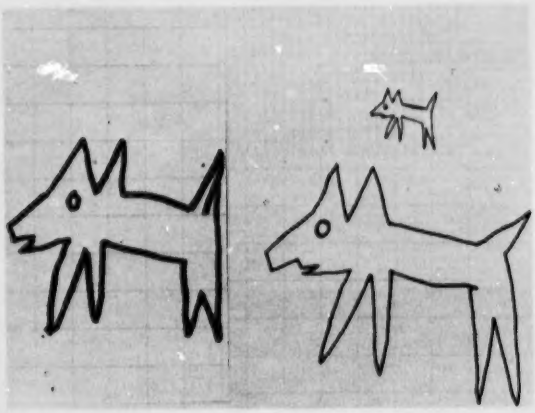
copying pictures, using graph paper

(groups of more than 2)

You need

assorted graph paper with different sizes of squares
pencils
a picture





Before you begin to play, one person draws a large picture — nothing complicated, just an outline — on paper or a piece of transparent acetate.

Hang the picture or put it on the overhead projector, so that everyone who plays can see it.

Each person takes a piece of graph paper. Try to get graph paper with different-sized squares in your group. Without tracing, everyone copies the picture on his graph paper.

Hang all the pictures.

What rules would you have to agree upon if you wanted the pictures to look more alike?

Can you do it?

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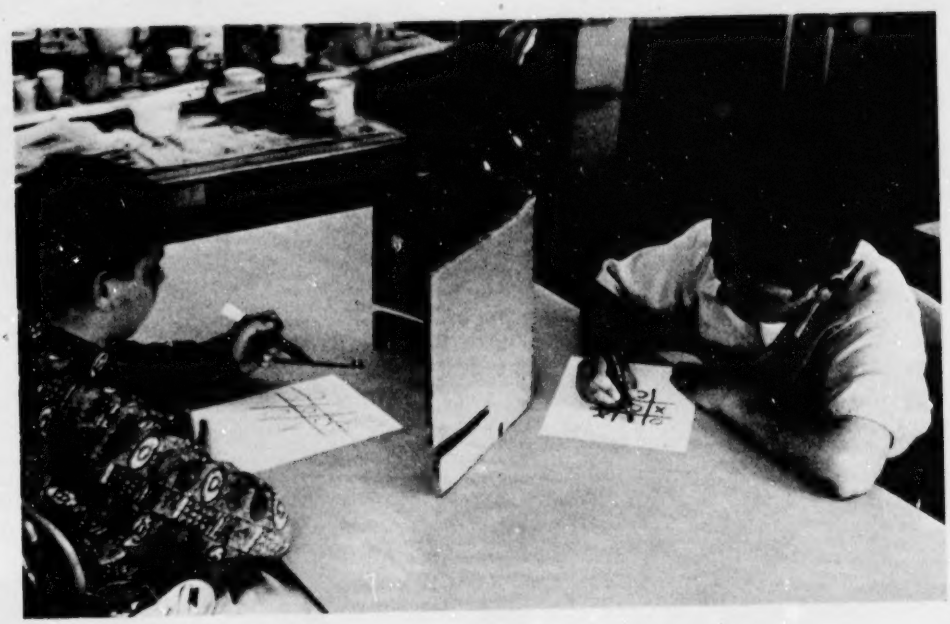
mapping game 31

tic-tac-toe

(2 people)

You need

paper and pencil
a screen



Play a game of tic-tac-toe, only *you* tell your partner where to put *your* mark and *he* tells you where to put *his*. Try doing it without pointing.

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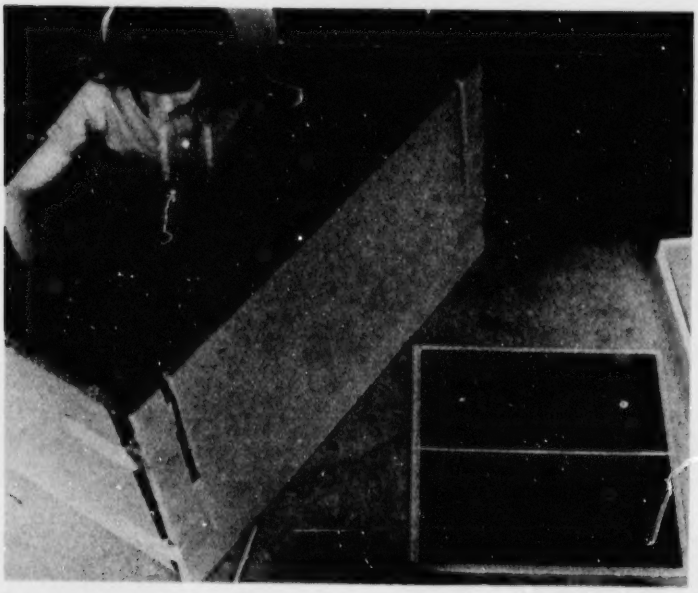
mapping game 32

2-d checkers

(2 people)

You need

2 checkerboards
2 sets of checkers (You can make your own with graph paper and colored paper checkers.)
a screen



This game is easier to play if you play with only eight men, or kings.

Sit so that you can't see your opponent's board. You have to move all the pieces on your board, your opponent's pieces as well as your own. You tell your opponent where to move your pieces, and he tells you where to move his. If you follow each other's directions, both boards should look the same.

From time to time, you may want to stop playing and check the boards. When you get to be very good at playing this way, you should be able to wait until the game is over before you check the boards. Try to keep a record of a game by drawing the moves.

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mapping game 33

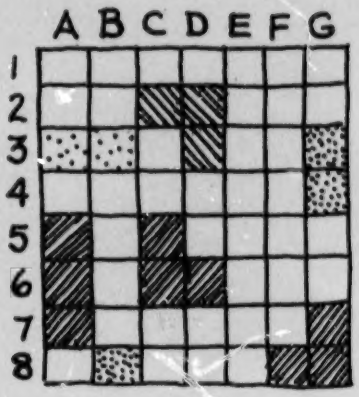
battleship

(2 people)

You need

- a screen
- graph paper
- pencils
- 7 markers to be used as ships (or you can pencil the ships on the graph paper)

Each player gets	Value
1 aircraft carrier	4 squares
2 battleships	3 squares
2 cruisers	2 squares
1 destroyer	1 square
1 submarine	1 square



Each ship covers a different number of squares of the graph paper. Here is an example of an area filled with all the pieces for battleships.

Start with a clean sheet of graph paper, and mark a boundary around the number of squares you plan to use for your ocean.

Place a screen right in the middle of the oceans, halfway between your partner and yourself.

Place the ships anywhere on your part of the ocean.

Each player is allowed 3 shots each turn. He has to call out what square he is shooting at: (2A), (7D), (5C), etc. If one of its squares is hit, a ship is out. Or, you can play that you have to hit all of a ship's squares to knock out the ship.

Do not tell your opponent he has hit one of your ships until he has called out all three shots. Then tell him which ship he has hit and where he hit it.

Keep a record of your shots and your opponent's shots.

The winner is the first one to sink all of his partner's ships.

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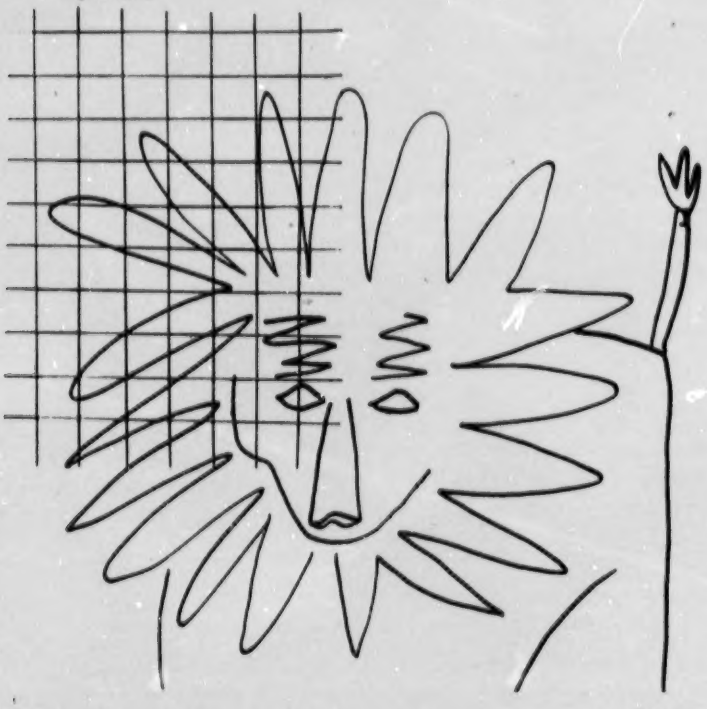
mapping game 34

using graph paper to enlarge and reduce pictures

(3 to 7 people)

You need

drawing material
assorted graph paper with different sizes of squares
a picture



Before you begin to play, one person draws a picture — nothing complicated, just an outline. Use paper or a sheet of transparent acetate.

Hang the picture or put it on the overhead projector.

What can you do to make your copy of the picture about twice as big.

Compare your way of doing it with other people's. Hang all the new pictures. Are they all about the same size? What methods did people use to enlarge the picture?

Now, try making the picture half as big. Hang the new pictures. Are they all the same size?

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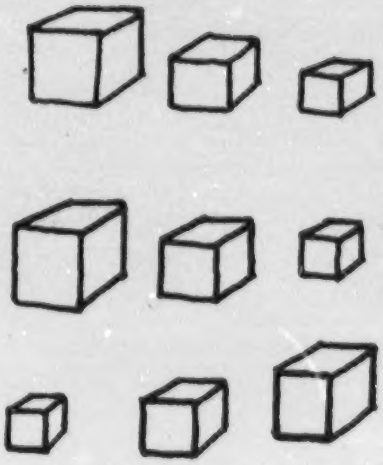
mapping game 35

making blocks look bigger or smaller

(1 to 2 people)

You need

- 3 blocks of the same shape in 3 different sizes
- 3 sheets clear acetate (for screens)
- 2 probe sticks (to support screens)
- small amount of modeling clay
- felt-tip pen
- tape



Place the blocks in a row (side by side) about 7 feet behind a sheet of acetate mounted on probe sticks set in modeling clay. Look at the blocks through the acetate with your eye at the same level as the blocks.

Draw the blocks on the acetate exactly the same size as you *see* them, even though you know what size they really are.

Change to a clean sheet of acetate. Move the blocks so that the biggest one is closest to the screen, the second biggest is a little farther away, and the smallest block is farthest away.

Draw the blocks again. Reverse the position of the smallest and the biggest blocks so that the smallest is very close and the biggest is farthest away.

On the third piece of acetate, draw the way the blocks look now.

Have someone else look at your three drawings.

Can they tell which blocks you used?

Can they tell which block is the smallest and which is the biggest?

Try some more arrangements of the blocks. Place them so that you cannot tell what size any of them really are.

You can clean off the acetate sheets with a little liquid soap and water on a paper towel.

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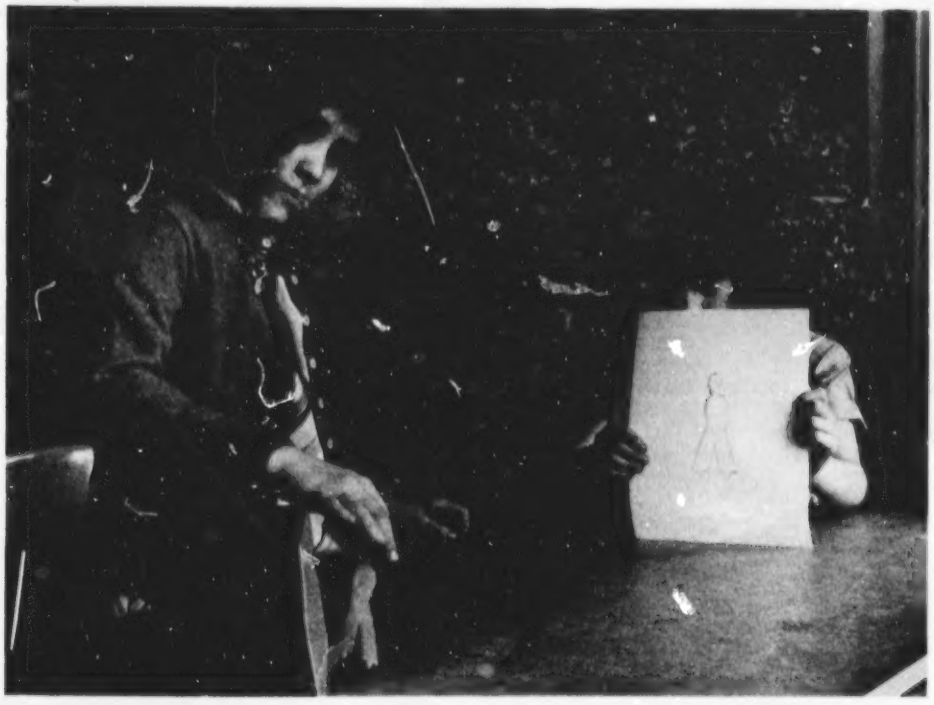
mapping game 36

enlarging and reducing shadows

(2 people)

You need

2 drawings that are exactly alike
a large piece of paper
a light source
scissors



Draw a simple picture and copy it onto a piece of tracing paper. Cut out one of the figures.

Hold your cutout in the light from a lamp or the sun to make a shadow. Have your partner hold up the uncut picture.

Make the shadow fit back into the uncut picture.

Make a big shadow that fills the whole paper.

Make a shadow that is much smaller than the cutout.

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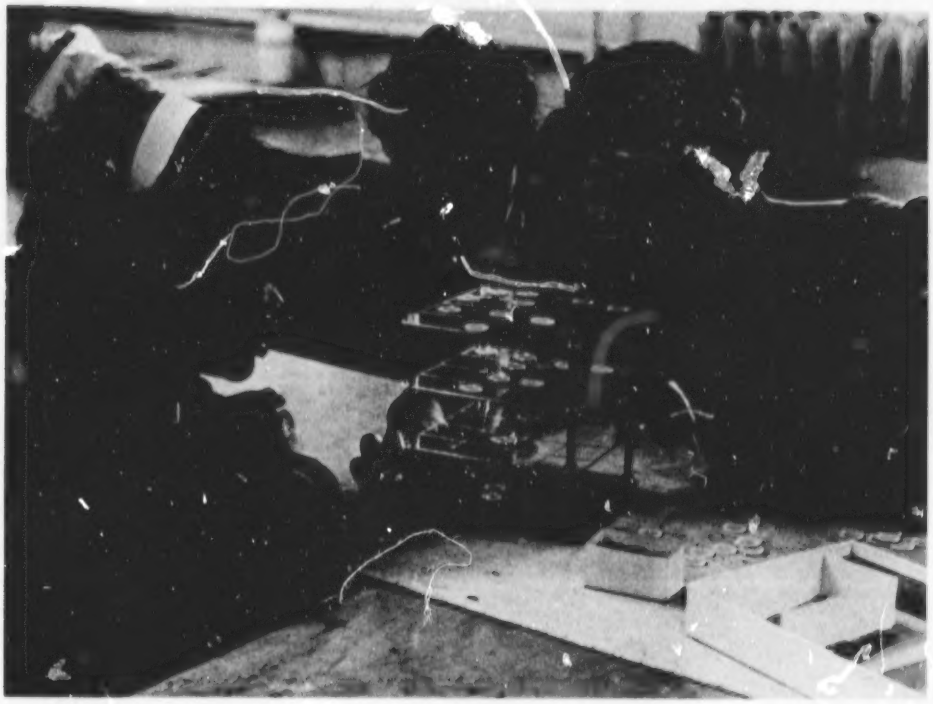
mapping game 37

3-d tic-tac-toe

(3 people)

You need

Qubic or 3-D Tic-Tac-Toe
paper and pencil



If you don't know the rules of Qubic, or 3-D Tic-Tac-Toe, play a few games before you play the mapping version.

One person acts as referee. Each player chooses a different color.

Taking turns, each of you explains (without pointing) where you want the referee to put your colored chips. (Put your hands behind your back — it helps.)

The first player to get four chips in a row in any direction is the winner.

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mapping game 38

finding an object in 3-d

(2 people or more)

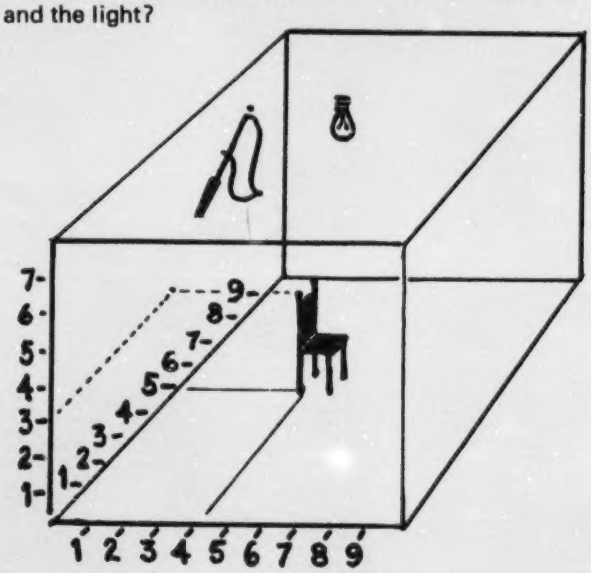
You need

measuring equipment
pencil and paper

To play this game, you will need to do a little work ahead of time.

Decide on a series of objects in the room that you want someone to locate. For example, you might choose a chair. Instead of giving word directions to find the chair, try using a set of numbers in a pattern or grid (see the picture). This system can give you as much information as directions.

Here is a classroom. What are the numbers for the flag, the chair, and the light?



	length	*width*	*height*
light	?	?	?
chair	?	?	?
flag	?	?	?

Agree with your partner on a way in which you will number the room. Choose some objects to locate using your number system.

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mapping game 39

make your own mapping game

You need

a card or a piece of paper
something to write or draw with

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